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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, CHAU M

ART UNIT PAPER NUMBER

2633

DATE MAILED: 02/25/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/853,318

Applicant(s)

HOSHIDA, TAKESHI

Examiner

Chau M Nguyen

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3,5,6.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a. "74" on line 26, page 12 should be changed to "72".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 2, 10, 17 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As claims 1, 10 and 17, "...rate within 0.4 to 0.6 of an integer;" is confusing.

As claims 2 and 20, "... the symbol rate within substantially 0.5 of the integer;" is also unclear.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4 - 10, 12 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee et al. (Hereinafter "Rhee") (U.S. Pat. No. 6,606,178 B1) in view of Nishizawa Hideki (Hereinafter "Nishizawa") (JP. Pat. No. 2000-059300A), (the electronic-version translation is also attached for understanding purpose), and in further view of Eklof et al. (Hereinafter "Eklof") (U.S. Pat. No. 6,058,147) .

As claims 1, 2, 9 and 10, Rhee discloses apparatus and method for processing information in a receiver of a multichannel optical communication system, comprising:

a demultiplexer (fig. 2, numerical reference 60) for receiving a wavelength division multiplexed (WDM) signal (col. 4, lines 4-8) comprising a plurality of non-intensity modulated optical information signals (col. 3, lines 65-67) having a minimum channel spacing (col. 1, lines 43-47);

demultiplexing the non-intensity modulated optical information signals from the WDM signal; and

a detector (denoted by 62₁, ... 62_N) for recovering a data signal from the intensity modulated optical information signal (col. 4, lines 25, 26).

Rhee differs from the claim 1 of the present invention in that, Rhee does not clearly show (in receiving step) minimum channel spacing comprising a multiple of the symbol rate within 0.4 to 0.6 of an integer; and

an asymmetric interferometer for converting (converting step) each of non-intensity modulated optical information signals to an intensity modulated optical information signal using an interferometer.

However, Eklof discloses minimum channel spacing comprising a multiple of the symbol rate within 0.4 to 0.6 of an integer (Eklof, col. 8, lines 42-45); and

Nishizawa discloses each of non-intensity modulated optical information signals is converted to an intensity modulated optical information using an asymmetric interferometer (Nishizawa, fig. 1, (13), Abstract, Solution Section, line 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to

(I) setup the minimum spacing channel at the defined range as taught by Eklof, and

(II) use an interferometer for converting each non-intensity modulated optical signal as taught by Nishizawa;

into the optical system of Rhee in order to support the system to process information in a narrow-band multichannel.

One having ordinary skill in the art would have been motivated for doing this since by setting the channel spacing based upon the operating parameters, such as symbol rate, the system would be automatically modified the appropriated channel spacing, and therefore to minimize the deterioration of the system (Eklof, col. 4, lines 4-10 and col. 4, lines 52-57). Further, due to the number of distributed routes increases, an asymmetric interferometer is used for increasing the intensity of the signal and

adjusting delay bit length of Mach-Zender interferometer, such that, improving the speed of the communication system. (Nishizawa, Effect of The Invention Section).

As claims 4, 6, 12 and 14, by considering the combination system of Rhee, Nishizawa and Eklof as applied in the independent claims 1 and 9, Nishizawa discloses an asymmetric Mach-Zender interferometer and the use of a dual detector (Nishizawa, fig. 1).

As claims 5 and 13, Nishizawa discloses the asymmetric interferometer comprising two interferometer paths having a path difference operable to create a one symbol period or one bit shift in the optical information signal. (Nishizawa, Abstract).

As claims 7 and 15, Rhee mentions the non-intensity modulated optical information signal comprises a frequency-modulated information signal (Rhee, col. 2, lines 24-27).

As claims 8 and 16, Rhee discloses the non-intensity modulated optical information signal comprises a phase-modulated information signal (Rhee, col. 5, lines 66-67).

As claims 17 and 20, Rhee discloses for communicating information in a wavelength division multiplexed (WDM) optical communication system, comprising:

transmitting each of a plurality of a data signals using non-intensity modulation of a wavelength disparate carrier signal (col. 7, lines 22-26), the carrier signals having a minimum channel spacing (col. 1, lines 43-47);

recovering the data signal using a detector (denoted by $62_1, \dots 62_N$) (col. 4, lines 25, 26).

Rhee differs from the claim invention in that Rhee fails to show the minimum channel spacing comprising a bit rate multiple within 0.4 to 0.6 of an integer; and an asymmetric Mach-Zender interferometer for converting the non-intensity modulation of the carrier signals into an intensity modulation.

However, Eklof discloses minimum channel spacing comprising a multiple of the symbol rate within 0.4 to 0.6 of an integer (Eklof, col. 8, lines 42-45); and

Nishizawa discloses each of non-intensity modulated optical information signals is converted to an intensity modulated optical information using an asymmetric interferometer (Nishizawa, fig. 1, (13), Abstract, Solution Section, line 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to

(I) setup the minimum spacing channel at the defined range as taught by Eklof, and

(II) use an asymmetric interferometer for converting each non-intensity modulated optical signal as taught by Nishizawa;

into the optical system of Rhee in order to support the system to process information in a narrow-band multichannel.

One having ordinary skill in the art would have been motivated for doing this since by setting the channel spacing based upon the operating parameters, such as symbol rate, the system would be automatically modified the appropriated channel spacing, and therefore to minimize the deterioration of the system (Eklof, col. 4, lines 4-10 and col. 4, lines 52-57). Further, due to the number of distributed routes increases, an asymmetric interferometer is used for increasing the intensity of the signal and adjusting delay bit length of Mach-Zender interferometer, such that, improving the speed of the communication system. (Nishizawa, Effect of The Invention Section).

Ac claims 18, Nishizawa discloses the asymmetric interferometer comprising two interferometer paths having a path difference operable to create a one symbol period or one bit shift in the optical information signal. (Nishizawa, Abstract).

As claim 19, Nishizawa shows a dual detector coupled to the complementary outputs of the Mach-Zender interferometer (Nishizawa, fig. 1).

4. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee in view of Nishizawa and Eklof (U.S. Pat. No. 6,058,147) as applied in the independent claims 1, and 9, and in further view of Roberts et al. (Hereinafter "Roberts") (U.S. Pat. No. 6,473,214 B1).

As claims 3 and 11, the communication system described in the rejection claims 1, and 9, as a combination system of Rhee, Nishizawa and Eklof, fails to show the symbol rate comprises a transmission bit rate of the WDM signal. However, Roberts discloses the symbol rate comprises a transmission bit rate of the WDM signal (Roberts, col. 8, lines 23-35). Therefore, it would have been obvious to one having ordinary skill in the art to involve the transmission bit rate with symbol rate resulting from the teaching of Roberts into the above combination system in order to improve direct detection and recovery the original binary signal at the optical receiver (Roberts, col. 7, lines 42-45).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Darcie (U.S. Pat. No. 4,794,351) is cited to show optical mixer for upconverting an optical signal.

King (U.S. Pat. No. 5,355,243) is cited to show direct detecting of optical PSK signals.

Oshima (U.S. Pat. No. 5,483,368) is cited to show an optical communication system.

Suzuki et al. (U.S. Pat. No. 6,005,702) is cited to show an optical transmission device. WDM optical transmission apparatus.

Hakki et al. (U.S. Pat. No. 6,549,311 B1) is cited to show wave division multiplexing channel telemetry by phase modulation.


Helkey (U.S. Pat. No. 6,616,353 B1) is cited to show laser intensity noise suppression using unbalance interferometer modulation.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chau M. Nguyen whose telephone number is 703-305-8965. The examiner can normally be reached on Mon-Fri from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4726. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

C.M.N.
Feb. 11, 2004


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